

OXY USA RMAT

**Garfield County, CO NAD27
Cascade Creek 697-05C Pad
CC 697-05-38B - Slot P**

OH

Design: OH

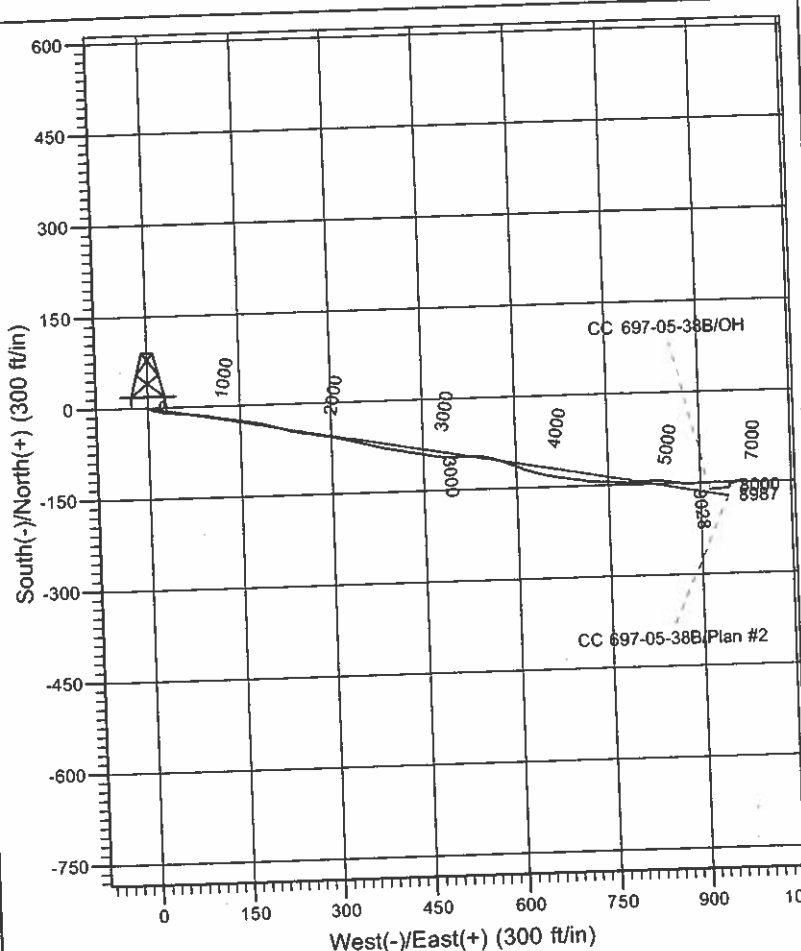
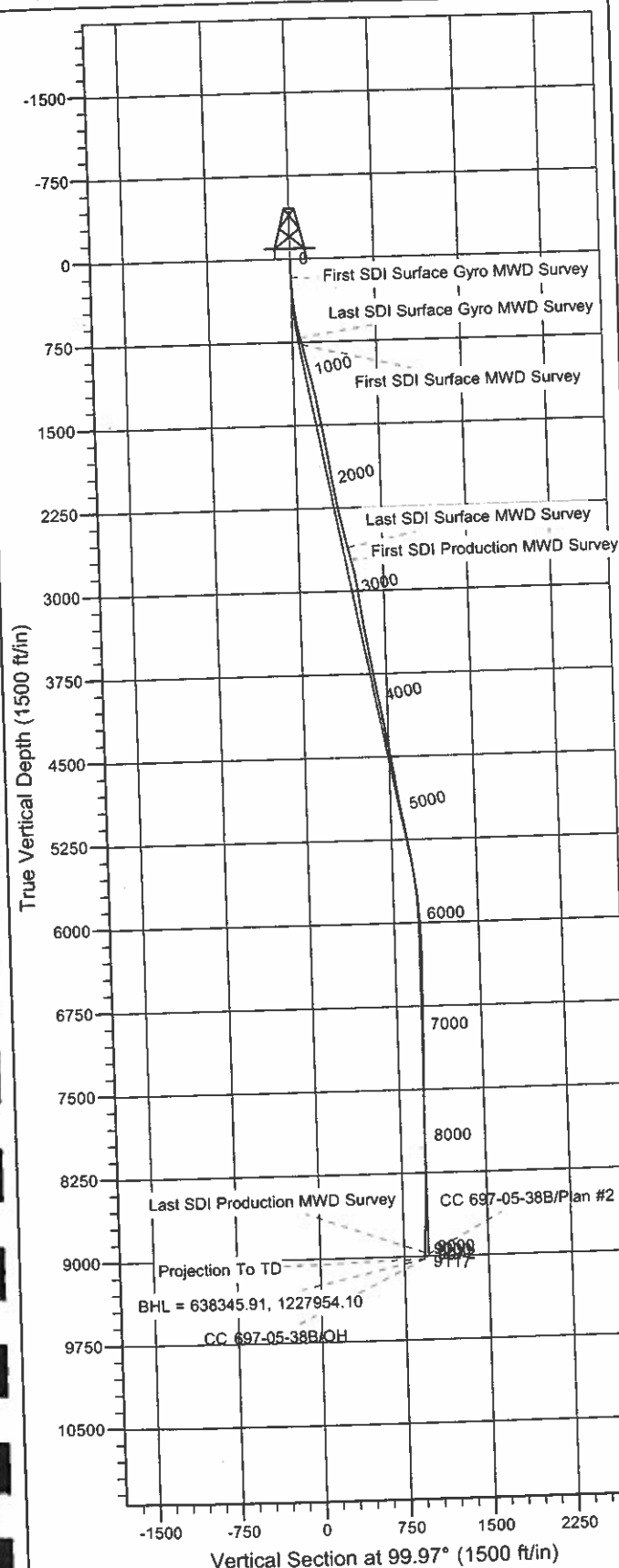
Standard Survey Report

01 December, 2011



Scientific Drilling

Company: OXY USA RMAT
Project: Garfield County, CO NAD27
Site: Cascade Creek 697-05C Pad
Well: CC 697-05-38B
Wellbore: OH
Design: OH



Well Details: CC 697-05-38B

TVD Reference: GL 8423' & RKB 30' @ 8453.00ft (H&P 353) Level: 8423.00		Latitude		Longitude		Slot
+N/-S	+E/-W	North	East	39° 33'	108° 14'	P
0.00	0.00	638534.35	1227043.77	16.472 N	29.971 W	

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well CC 697-05-38B - Slot P, True North
Vertical (TVD) Reference: GL 8423' & RKB 30' @ 8453.00ft (H&P 353)
Section (VS) Reference: Slot - P(0.00N, 0.00E)
Measured Depth Reference: GL 8423' & RKB 30' @ 8453.00ft (H&P 353)
Calculation Method: Minimum Curvature

PROJECT DETAILS: Garfield County, CO NAD27

Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: Colorado Central 502

System Datum: Mean Sea Level

Plan: OH

12:14, December 01 2011
Created By: Rex Hall

Scientific Drilling International

Survey Report

Company: OXY USA RMAT
Project: Garfield County, CO NAD27
Site: Cascade Creek 697-05C Pad
Well: CC 697-05-38B
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well CC 697-05-38B - Slot P
TVD Reference: GL 8423' & RKB 30' @ 8453.00ft (H&P 353)
MD Reference: GL 8423' & RKB 30' @ 8453.00ft (H&P 353)
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: Rockies Compass Server

Project	Garfield County, CO NAD27		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	Colorado Central 502		

Site	Cascade Creek 697-05C Pad, Sec. 5 T6S R97W			
Site Position:		Northing:	637,463.43 usft	Latitude: 39° 33' 5.626 N
From: Map		Easting:	1,226,150.07 usft	Longitude: 108° 14' 40.963 W
Position Uncertainty:	0.00 ft	Slot Radius:	0.000 in	Grid Convergence: -1.73 °

Well	CC 697-05-38B - Slot P			
Well Position	+N/-S	0.00 ft	Northing:	638,534.35 usft
	+E/-W	0.00 ft	Easting:	1,227,043.77 usft
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft
			Ground Level:	8,423.00 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2005-10	2010/12/16	10.51	65.77	52,312

Design	OH				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.00	0.00	0.00		99.97

Survey Program	Date	2011/12/01			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
173.00	714.00	Survey #1 - Surface Gyro MWD (OH)	SDI Gyro MWD 104	SDI Gyro MWD Error Model Ver 1.0.4	
784.00	2,653.00	Survey #2 - Surface MWD (OH)	MWD-SDI	MWD - Standard ISCWSA	
2,763.00	9,117.00	Survey #3 - Production MWD (OH)	MWD-SDI	MWD - Standard ISCWSA	

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
173.00	1.85	121.29	172.97	-1.45	2.39	2.60	1.07	1.07	0.00
First SDI Surface Gyro MWD Survey									
263.00	2.99	115.93	262.89	-3.23	5.74	6.21	1.29	1.27	-5.96
354.00	4.57	97.38	353.69	-4.74	11.47	12.12	2.17	1.74	-20.38
444.00	6.07	104.85	443.30	-6.42	19.63	20.44	1.83	1.67	8.30
534.00	8.97	97.73	532.52	-8.58	31.18	32.19	3.38	3.22	-7.91
623.00	11.52	95.45	620.09	-10.36	46.90	47.99	2.90	2.87	-2.56
714.00	14.25	94.83	708.79	-12.16	67.11	68.21	3.00	3.00	-0.68

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Survey Report

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 Site: Cascade Creek 697-05C Pad
 Well: CC 697-05-38B
 Wellbore: OH
 Design: OH

Local Co-ordinate Reference: Well CC 697-05-38B - Slot P
 TVD Reference: GL 8423' & RKB 30' @ 8453.00ft (H&P 353)
 MD Reference: GL 8423' & RKB 30' @ 8453.00ft (H&P 353)
 North Reference: True
 Survey Calculation Method: Minimum Curvature
 Database: Rockies Compass Server

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
Last SDI Surface Gyro MWD Survey									
784.00	13.19	99.45	776.80	-14.20	83.58	84.77	2.18	-1.51	6.60
First SDI Surface MWD Survey									
874.00	15.04	99.45	864.08	-17.80	105.23	106.72	2.06	2.06	0.00
964.00	13.45	99.28	951.31	-21.41	127.08	128.87	1.77	-1.77	-0.19
1,059.00	11.08	99.80	1,044.13	-24.74	146.98	149.04	2.50	-2.49	0.55
1,154.00	13.19	97.70	1,137.00	-27.75	166.72	169.01	2.27	2.22	-2.21
1,248.00	11.87	103.76	1,228.77	-31.49	186.74	189.37	1.98	-1.40	6.45
1,343.00	8.71	107.36	1,322.23	-35.96	203.10	206.26	3.39	-3.33	3.79
1,437.00	9.67	105.17	1,415.02	-40.15	217.51	221.18	1.09	1.02	-2.33
1,532.00	12.13	104.02	1,508.30	-44.66	234.90	239.08	2.60	2.59	-1.21
1,626.00	10.38	99.63	1,600.49	-48.46	252.83	257.40	2.07	-1.86	-4.67
1,721.00	8.35	98.57	1,694.22	-50.92	268.09	272.86	2.14	-2.14	-1.12
1,815.00	8.75	100.25	1,787.17	-53.21	281.88	286.83	0.50	0.43	1.79
1,910.00	8.44	100.33	1,881.11	-55.75	295.84	301.03	0.33	-0.33	0.08
2,005.00	8.53	102.09	1,975.07	-58.48	309.59	315.04	0.29	0.09	1.85
2,099.00	9.50	102.44	2,067.91	-61.61	323.99	329.76	1.03	1.03	0.37
2,194.00	10.20	104.29	2,161.51	-65.37	339.79	345.98	0.81	0.74	1.95
2,288.00	11.26	107.36	2,253.86	-70.17	356.62	363.38	1.28	1.13	3.27
2,382.00	11.78	102.71	2,345.97	-75.01	374.74	382.07	1.13	0.55	-4.95
2,477.00	12.75	102.35	2,438.80	-79.39	394.44	402.23	1.02	1.02	-0.38
2,571.00	12.31	100.51	2,530.56	-83.44	414.42	422.61	0.63	-0.47	-1.96
2,653.00	12.93	99.63	2,610.58	-86.57	432.06	440.53	0.79	0.76	-1.07
Last SDI Surface MWD Survey									
2,763.00	13.62	102.85	2,717.64	-91.51	456.82	465.77	0.92	0.63	2.93
First SDI Production MWD Survey									
2,857.00	12.66	96.73	2,809.18	-95.17	477.85	487.11	1.80	-1.02	-6.51
2,952.00	8.97	91.02	2,902.48	-96.53	495.60	504.82	4.04	-3.88	-6.01
3,046.00	7.74	85.92	2,995.48	-96.21	509.24	518.20	1.53	-1.31	-5.43
3,141.00	7.91	86.88	3,089.60	-95.40	522.15	530.78	0.23	0.18	1.01
3,235.00	8.62	98.22	3,182.63	-96.05	535.58	544.12	1.89	0.76	12.06
3,330.00	8.09	96.73	3,276.62	-97.85	549.26	557.91	0.60	-0.56	-1.57
3,425.00	8.53	106.84	3,370.63	-100.68	562.65	571.58	1.60	0.46	10.64
3,519.00	9.58	110.18	3,463.46	-105.39	576.66	586.20	1.25	1.12	3.55
3,614.00	8.71	111.05	3,557.25	-110.71	590.79	601.04	0.93	-0.92	0.92
3,708.00	9.85	113.52	3,650.02	-116.47	604.81	615.84	1.28	1.21	2.63
3,803.00	10.11	107.63	3,743.58	-122.24	620.21	632.00	1.11	0.27	-6.20
3,895.00	9.23	107.01	3,834.27	-126.84	634.96	647.33	0.96	-0.96	-0.67
3,990.00	10.64	102.79	3,927.85	-131.01	650.80	663.65	1.67	1.48	-4.44
4,084.00	10.11	100.51	4,020.31	-134.44	667.37	680.57	0.71	-0.56	-2.43
4,179.00	10.55	98.84	4,113.77	-137.30	684.16	697.60	0.56	0.46	-1.76
4,273.00	10.29	97.70	4,206.22	-139.74	700.99	714.59	0.35	-0.28	-1.21
4,368.00	9.06	101.04	4,299.67	-142.31	716.74	730.55	1.42	-1.29	3.52
4,462.00	8.88	91.72	4,392.72	-143.95	731.25	745.13	1.56	-0.19	-9.91

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Design: OH

Local Co-ordinate Reference: Well CC 697-05-38B - Slot P
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MD Reference: GL 8423' & RKB 30' @ 8453.00ft (H&P 353)
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: Rockies Compass Server

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,557.00	9.32	91.81	4,486.53	-144.41	746.27	760.00	0.46	0.46	0.09
4,652.00	10.82	94.71	4,580.06	-145.39	762.85	776.50	1.67	1.58	3.05
4,746.00	9.41	93.13	4,672.60	-146.53	779.32	792.91	1.53	-1.50	-1.68
4,841.00	8.53	84.51	4,766.44	-146.28	794.08	807.42	1.69	-0.93	-9.07
4,935.00	8.97	85.39	4,859.35	-145.03	808.33	821.23	0.49	0.47	0.94
5,030.00	9.76	89.43	4,953.08	-144.35	823.76	836.31	1.08	0.83	4.25
5,124.00	9.94	98.40	5,045.70	-145.46	839.76	852.26	1.64	0.19	9.54
5,219.00	9.06	99.45	5,139.40	-147.88	855.25	867.93	0.94	-0.93	1.11
5,313.00	9.76	97.78	5,232.13	-150.18	870.44	883.30	0.80	0.74	-1.78
5,408.00	10.38	88.20	5,325.67	-151.00	886.97	899.72	1.88	0.65	-10.08
5,502.00	10.20	86.36	5,418.16	-150.20	903.74	916.10	0.40	-0.19	-1.96
5,597.00	8.88	90.49	5,511.85	-149.73	919.47	931.51	1.56	-1.39	4.35
5,691.00	6.86	91.28	5,604.96	-149.92	932.34	944.22	2.15	-2.15	0.84
5,786.00	6.42	89.87	5,699.32	-150.03	943.32	955.06	0.49	-0.46	-1.48
5,880.00	4.57	86.53	5,792.88	-149.79	952.32	963.87	2.00	-1.97	-3.55
5,975.00	3.78	85.21	5,887.63	-149.30	959.22	970.58	0.84	-0.83	-1.39
6,069.00	2.46	77.22	5,981.49	-148.60	964.27	975.44	1.48	-1.40	-8.50
6,164.00	1.85	78.27	6,076.42	-147.84	967.76	978.74	0.64	-0.64	1.11
6,258.00	1.23	85.74	6,170.39	-147.45	970.25	981.13	0.69	-0.66	7.95
6,353.00	0.44	90.31	6,265.38	-147.38	971.64	982.48	0.83	-0.83	4.81
6,447.00	0.26	221.62	6,359.38	-147.54	971.85	982.72	0.68	-0.19	139.69
6,542.00	1.14	238.85	6,454.37	-148.19	970.90	981.90	0.94	0.93	18.14
6,636.00	1.32	218.81	6,548.35	-149.52	969.42	980.67	0.49	0.19	-21.32
6,730.00	0.53	2.86	6,642.34	-149.93	968.77	980.10	1.89	-0.84	153.24
6,825.00	0.53	345.63	6,737.34	-149.06	968.68	979.86	0.17	0.00	-18.14
6,920.00	0.62	290.09	6,832.33	-148.46	968.09	979.17	0.57	0.09	-58.46
7,014.00	0.97	272.16	6,926.32	-148.26	966.82	977.88	0.45	0.37	-19.07
7,109.00	1.67	273.48	7,021.30	-148.14	964.63	975.71	0.74	0.74	1.39
7,203.00	0.97	235.95	7,115.27	-148.50	962.60	973.78	1.15	-0.74	-39.93
7,298.00	1.14	249.13	7,210.26	-149.29	961.05	972.39	0.31	0.18	13.87
7,392.00	1.41	246.93	7,304.23	-150.08	959.12	970.62	0.29	0.29	-2.34
7,487.00	1.85	250.71	7,399.20	-151.04	956.59	968.30	0.48	0.46	3.98
7,581.00	1.14	265.65	7,493.16	-151.61	954.23	966.07	0.86	-0.76	15.89
7,676.00	1.58	268.55	7,588.14	-151.72	951.98	963.87	0.47	0.46	3.05
7,770.00	0.79	219.69	7,682.12	-152.25	950.27	962.28	1.29	-0.84	-51.98
7,865.00	1.41	218.63	7,777.10	-153.67	949.12	961.39	0.65	0.65	-1.12
7,959.00	0.70	142.61	7,871.09	-155.03	948.75	961.26	1.50	-0.76	-80.87
8,054.00	0.44	139.00	7,966.08	-155.76	949.34	961.97	0.28	-0.27	-3.80
8,148.00	0.88	214.59	8,060.08	-156.63	949.17	961.95	0.94	0.47	80.41
8,243.00	0.88	227.60	8,155.07	-157.72	948.21	961.20	0.21	0.00	13.69
8,337.00	0.97	236.04	8,249.05	-158.65	947.02	960.19	0.17	0.10	8.98
8,432.00	1.32	260.56	8,344.04	-159.28	945.27	958.58	0.63	0.37	25.81
8,526.00	1.76	263.90	8,438.00	-159.61	942.77	956.17	0.48	0.47	3.55

Scientific Drilling International

Survey Report

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Site: Cascade Creek 697-05C Pad
Well: CC 697-05-38B
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well CC 697-05-38B - Slot P
TVD Reference: GL 8423' & RKB 30' @ 8453.00ft (H&P 353)
MD Reference: GL 8423' & RKB 30' @ 8453.00ft (H&P 353)
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: Rockies Compass Server

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
8,621.00	1.85	266.80	8,532.95	-159.85	939.79	953.27	0.13	0.09	3.05
8,715.00	2.37	271.89	8,626.89	-159.87	936.33	949.87	0.59	0.55	5.41
8,810.00	3.08	263.90	8,721.78	-160.08	931.83	945.47	0.85	0.75	-8.41
8,904.00	3.34	267.06	8,815.63	-160.49	926.58	940.38	0.33	0.28	3.36
8,999.00	2.99	271.98	8,910.49	-160.55	921.34	935.23	0.47	-0.37	5.18
9,060.00	2.73	264.51	8,971.41	-160.63	918.31	932.25	0.74	-0.43	-12.25
Last SDI Production MWD Survey									
9,117.00	2.73	264.51	9,028.35	-160.89	915.61	929.63	0.00	0.00	0.00
Projection To TD - BHL = 638345.91, 1227954.10									

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
173.00	172.97	-1.45	2.39	First SDI Surface Gyro MWD Survey
714.00	708.79	-12.16	67.11	Last SDI Surface Gyro MWD Survey
784.00	776.80	-14.20	83.58	First SDI Surface MWD Survey
2,653.00	2,610.58	-86.57	432.06	Last SDI Surface MWD Survey
2,763.00	2,717.64	-91.51	456.82	First SDI Production MWD Survey
9,060.00	8,971.41	-160.63	918.31	Last SDI Production MWD Survey
9,117.00	9,028.35	-160.89	915.61	Projection To TD
9,117.00	9,028.35	-160.89	915.61	BHL = 638345.91, 1227954.10

Checked By: _____ Approved By: _____ Date: _____